

AMATEUR SATELLITE REPORT

AMSAT® NA Newsletter for the Amateur Radio Space Program



Amateur Satellite Report is endorsed by the
American Radio Relay League as the special interest
Newsletter serving the Amateur Radio Satellite Community

Number 151
June 15, 1987

Editor: Vern Riportella, WA2LQQ
Contr. Editors:
Pete Killingsworth, KD7WZ
Managing Editor: Bob Myers, W1XT

Copyright 1987 by AMSAT® NA, The Radio Amateur
Satellite Corporation. AMSAT® is a registered trademark.

FO-12 Test Crashes OBC

During the extensive FO-12 duty tests commenced May 12, the On Board Computer (OBC) crashed for reasons unknown. On May 14, the digital transponder stopped responding to uplink frames and transmitted flags continuously until the command station noticed this trouble and shut it off.

According to Peter Guelzow, DB2OS, the OBC crash happened while he was engaged in a QSO with HB9MHM which was interrupted by the OBC crash. He received nothing but the flags after that.

Tak, JA2PKI, says JAMSAT is investigating the crash and will report soon on their findings. The failure is thought to not indicate serious problems but rather the sort of startup software bugs which often occur. The backup JAS-1 spacecraft, JAS-1A, is being used as a software test bed for the BBS system development.

Tracking Program Update From W0SL

Attention users of the W0SL tracking programs ORBITS II and ORBITS III. Compiled versions 1.01, 1.02, 1.03 and 1.04 of these programs were written to interface with the KENPRO KR-010 Computer Interface unit at 4800 bits-per-second (bps). It appears that now a version of the KR-010 is being distributed that operates at 9600 bps. Both the 4800 bps and the 9600 bps versions are being used. The 9600 bps version will not function with the above versions of the two programs.

Accordingly, Roy, W0SL, has produced Version 1.05 of these two programs which gives the user the ability to select either of the two speeds at program setup time to match the speed of the users KR-010. If you have one of the above versions of Roy's programs, you may exchange it for version 1.05 by returning the original program diskette to Roy with a self addressed and stamped diskette mailer (\$0.56 postage). NOTE: Only the original program diskette will be accepted. No exceptions. Do not, repeat, do not confuse these two programs with earlier satellite tracking programs by W0SL that require BASICA to run. You can recognize the compiled ORBITS II and ORBITS III programs from the opening logo containing the program names and the 1987 copyright notice.

Russians Said Poised For "MAREX", RS-9 Launches

European sources say an Amateur Radio station will soon be launched to the Russian Mir Space Station. If true, an Amateur Radio station aboard Mir would comprise the first known Amateur Radio activity from a manned Russian space facility. MAREX, or Mir Amateur Radio Experiment, as it has been nicknamed, would probably be aimed at a broad international participation to reap maximum exposure and benefit.

The first "Ham-In-Space" activity was performed by NASA Astronaut Dr. Owen Garriott, W5LFL, in December, 1983. This was followed by Astronaut Dr. Tony England, W0ORE's, flight of July, 1985. Tony's experiments were collectively called SAREX for Shuttle Amateur Radio Experiment. Limited activity by a German and Dutch Amateur aboard the European Spacelab on Shuttle also was performed.

It is unknown at present if the rumored MAREX will be an hf or vhf station and if vhf, if it will use SSB or FM modes. SSB vhf is the most popular vhf mode in Europe but it is difficult to imagine its use with Mir because of the high Doppler shift that would result. FM would be the preferred mode. The official name of the Mir Amateur Radio activity



Preparing for the crowds prior to opening the AMSAT booth at Dayton are Mike Crisler, N4IFD (left) and John Champa, K8OCL.

has not yet been revealed but western analysts have dubbed it MAREX until its official name and existence is confirmed.

In related news, the launch of RS-9 continues to be asserted as "imminent." June is likely. See the frequency listing in ASR149.

AO-10 Communications Improving Daily

Spacecraft controllers released AMSAT OSCAR 10 for general use on May 15 as sun angles have been improving. While operating conditions are not quite up to the best they've been, they are improving and many are finding the Mode B transponder quite usable. Mode B use is authorized between MA 30 and 220. Uplink power levels must be kept very low or the the operating period will have to be restricted to keep energy consumption under close management. If FMing of the beacon or passband signals is observed, all operations must cease at once. Continuous carrier modes such as RTTY, SSTV and FAX are prohibited.

Some questions remain concerning the actual spacecraft attitude since the spin modulation fade rate is not quite as expected. It is now believed the 2 meter omni antenna is switched into the downlink circuit. This could contribute to the less potent signals heard recently. The omni antenna probably has at best 5 dB less gain than the 2 meter high gain array.

Estimates of the attitude are critical to proper scheduling and to extending spacecraft life. You can help determine the attitude with some rather simple measurements made by observing the beacon. According to G3RUH, all you need do is observe the beacon for a few orbits and report your findings. G3RUH will collect the observation reports and make the calculations necessary to determine the attitude.

Monitor the beacon through a pass and note the time when the spin modulation seems to disappear and when it seems to reappear. This will occur roughly between MA 20 and 90. Keep your station configuration constant. That is, change only the az/el of your tracking antennas while leaving unchanged all other equipment settings. Then forward to G3RUH the date/times (in UTC) of your observation and your geographic coordinates in latitude and longitude. More than one orbit would help too; say one or two orbits per week for three weeks. Mail to James Miller, G3RUH, 3 Benny's Way, Coton, Cambridge, CB3 7PS, England. This way you can actually help in spacecraft operations planning by helping to refine estimates of spacecraft attitude.

Please stay in tune with official bulletin sources for any last minute changes to these tentative plans. Bulletins are carried on the AMSAT nets and specific operational guidance is being carried by W1AW of the ARRL and GB2RS of the RSGB.

Phase 3C Launch Pegged In January

Arianespace released its new manifest Friday, May 15. It shows that AMSAT's Phase 3C satellite will be launched in January 1988 on flight V-22. There are several caveats at-

tached to this date, however. The manifest notes the possibility of launching as early as November, 1987, if V-22 can be interspersed between V-20 and V-21. This will depend on many factors including the ability to modify the launch pad to accommodate the new, larger Ariane 4 launcher which will carry Phase 3C.

AMSAT now believes there is a reasonable chance Phase 3C will be launched in first quarter of 1988. But Arianespace points out the entire schedule presumes the V-19 mission is launched in August. Achieving this depends on acceptance of the V-19 third stage engine which has not yet been accomplished.

Nevertheless, AMSAT will be providing details of Phase 3C and special operating hints over the next weeks and months. Watch for details in *ASR* and *QEX*.

Ariane Manifest May 1987

Launch	Vehicle	Satellites
V-19 Aug 87	AR 3	AUSSAT K3 & ECS 4
V-20 Oct 87	AR 2	TVSAT 1
V-21 Dec 87	AR 3	G STAR III/GEOSTAR R01 & TELECOM 1C
V-22 *Jan 88	AR 4	APEX 401: METEOSAT P2 & AMSAT & PANAMSAT
V-23 Mar 88	AR 2	INTELSAT V F13
V-24 Apr 88	AR 2	TDF-1
V-25 May 88	AR 3	SPACENET IIIR/GEOSTAR R02 & SBS 5
V-26 Jun 88	AR 3	ECS 5 & INSAT 1C
V-27 Sep 88	AR 4	ASTRA 1 & MOP 1
V-28 Oct 88	AR 2	INTELSAT V F15
V-29 Nov 88	AR 4	TELE-X** & SKYNET 4B
V-30 Jan 89	AR 3	OLYMPUS
V-31 Feb 89	AR 4	JCSAT & DFS 1
V-32 Mar 89	AR 2	SPOT2
V-33 Apr 89	AR 4	SUPERBIRD-A & HIPPARCOS
V-34 May 89	AR 4	INTELSAT V1F1
V-35 Jun 89	AR 4	SUPERBIRD-B & INMARSAT 2F1
V-36 Sep 89	AR 4	TDF-2 & DFS2 (or INMARSAT 2F2 or GSTAR IV/GEOSTAR TR1)
V-37 Oct 89	AR 4	SATCOM K3 & INMARSAT2F2 (or DFS2 or GSTAR IV/GEOSTAR TR1)
V-38 Nov 89	AR 4	INTELSAT V1F2
V-39 Jan 90	AR 4	EUTELSAT IIA & MOP 2
V-40 Feb 90	AR 4	TVSAT2 & GSTAR IV/GEOSTAR TR1 (or DFS2 or INMARSAT 2F2)
V-41 Mar 90	AR 4	EUTELSAT IIB & SKYNET 4C (or ERS1)
V-42 Apr 90	AR 4	INTELSAT V1F3 (or ANIK E1)
V-43 May 90	AR 4	ERS 1 (or EUTELSAT IIB & SKYNET 4C)
V-44 Jun 90	AR 4	ANIK E1 (or INTELSAT V1F3)
V-45 Sep 90	AR 4	EUTELSAT IIC & ITALSAT 1
V-46 Oct 90	AR 4	SATCOM K4 & GEOSTAR II
V-47 Nov 90	AR 4	ANIK E2
V-48 Jan 91	AR 4	F.O. & MOP3

* Decision to launch ARIANE 401 between Flights 21 & 23 or between Flights 20 & 21 will be made later on.

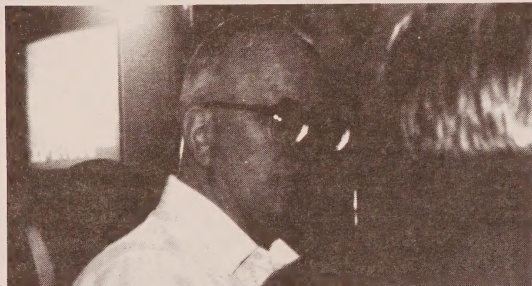
** In the event that SSC decides to schedule TELE-X on another launch, JC-SAT will have priority on Flight 29.

New Net Logs Firsts

AMSAT nets have been on the air for more than 16 years and have seen many an interesting event. But an AMSAT net in Detroit recently logged a significant first as a result of the new Novice license enhancement. The Detroit Area AMSAT Net reported what may have been the first check-ins of Novice Class stations to an official AMSAT net.

The new net participants were John, KA8ZKZ, and Jerry, KB8AKS. Net Control Station John Champa, K8OCL, thus had the dual pleasure of introducing both simultaneously to Amateur Radio and to the Amateur Space Program in one forum. John, KA8ZKZ, has since joined AMSAT and the local AMSAT group under the leadership of Larry Koziel, K8MU, AMSAT Area Coordinator for Michigan.

The Detroit Area AMSAT Net airs every Wednesday evening at 8PM local time on 224.46 MHz on the WD8CIK Repeater System. Although the Detroit Area AMSAT Net originates on the WD8CIK repeater output at 224.46 MHz, it is simultaneously transmitted via rf links on repeater outputs at 147.22 MHz, 443.00 MHz, 443.55 MHz and 1288.99 MHz.



Roy Welch, W0SL, explains his new PC program to a Hamvention attendee.

Free Autotracking System Offered in Membership Drive

AMSAT Headquarters has announced a special addition to its 1987 membership drive. Last week AMSAT announced an array of prizes for the top performers in bringing in new members and renewals. Now AMSAT has added a special bonus program to encourage you to renew yourself. Here are the details.

You can become eligible for prizes in two ways. By signing up other new members or renewals you become eligible to win the IC-275A 2 meter all mode transceiver or a host of other valuable prizes such as preamps, antennas, software, etc. By renewing yourself, you become eligible for a major bonus prize, a complete satellite autotracking system including computer, display, rotors, antennas and software. (Tower, cables and miscellaneous parts not included.) The more years you renew for, the more chance you have to win the big prize. Life members may participate by undertaking an annual "Sustaining Life Membership for 1987". Letters are on the way to all Life Members.

All new members or renewals will receive a special bonus of a free supply of member (or special life member) decals to affix to your QSL cards. These handsome two color decals are the size of a large Air Mail stamp and have the AMSAT logo proudly displayed for you to let everyone know you're a member of AMSAT.

Complete details appear in ASR 152. But don't wait. Get your head start now. To be eligible for the IC-275A, sign up as many new or renewing AMSAT members as you can. To be eligible for the autotrack system, renew yourself today. All renewals submitted between May 22 and October

31 are eligible. Drawing will be held at the Annual Meeting on November 7. Send an SASE to AMSAT today for contest rules and membership application blanks. Write to AMSAT, P.O. Box 27, Washington, D.C. 20044.

AMSAT UK and University of Surrey To Host Meeting In July

Encouraged by the success of the 1986 AMSAT-UK/UoSAT Colloquium at the University of Surrey, these groups have scheduled another two-day gathering for July 18 and 19 this year. There will be an international lineup of expert speakers on all topics related to the Amateur Satellite Service. If you wish to attend, you MUST BOOK IN ADVANCE THROUGH: AMSAT-UK, 94 Herongate Road, Wanstead Park, London, E12 5EQ, UK.

Preliminary Programme and List of Speakers

Friday 17 July

- 1800 Registration
- 1900 UoSAT Mission Control Centre Tours

Saturday 18 July

- 0830 Registration
- 0930 Coffee
- 1000 Welcome - Director of UoSAT & Chairman, AMSAT-UK
- 1015 Opening Address - RSGB President
- 1030 The Amateur Satellite Programme - Overview by Dr. Martin Sweeting, G3YJO
- 1045 Introduction to Amateur Satellites in Practice: to cover basic orbit configurations, terminology, frequencies, antennas, operational modes, and equipment.
- 1115 Tracking Topics by James Miller, G3RUH.
- 1145 Operating on Mode-B, J & L by Graham Ratcliff, VK5AGR.
- 1245 LUNCH
- 1415 UoSAT Spacecraft Operations & Results of Experiments
- 1445 Fuji-OSCAR-12 Status
- 1530 AMSAT-Phase-111C/D Status by Karl Mienzer, DJ4ZC.
- 1600 TEA

B-STREAM: Satellites In Education Presentations, Demonstrations, Discussions.

- 1610 RS Satellites by Leonid Labutin, UA3CR.
- 1650 Overview of plans and status of UO-C spacecraft.
- 1710 AMSAT-Phase-IV Plans by Jan King, W3GEY.
- 1800 DINNER
- 1945 AMSAT-UK AGM and UoSAT Mission Control tours.
- 2100 AMRAC AGM

Sunday 19 July

- B-STREAM: G3IOR - RS satellites, Propagation 0930-1030
- G3AFN - UoSAT-OSCAR-9 Orbital Decay 1030-1130
- RIG - Weather Satellites 1130-1245
- 0930 Introduction to Packet Radio Standards, Protocols, Equipment, Digepeaters, Bulletin Boards.
- 1030 Modulation Schemes and Modems for amateur satellites, by James Miller.
- 1115 Using RUDAK on Phase-111C: equipment and operating procedures.
- 1145 DCE 'Gateway' Operation
- 1210 DISCUSSION - OPEN FORUM

B-STREAM: Swedish Space Activities Thomas Johansson, SM5IXE.

- 1415 AMSAT-OSCAR-10 Status Report from Graham Ratcliff, VK5AGR and Ian Ashley, ZL1AOX
- 1450 The Soviet Space Programme by Geoff Perry.
- 1520 DISCUSSION - OPEN FORUM
- 1600 CLOSE OF PROCEEDINGS - TEA

ORBIT PREDICTIONS

Satellite OSCAR-9
 Catalog number 12888
 Epoch time: 87130.01480737
 Element set: 1030
 Inclination: 97.6469 deg
 RA of node: 146.2290 deg
 Eccentricity: 0.0003001
 Arg of perigee: 26.7803 deg
 Mean anomaly: 333.3611 deg
 Mean motion: 15.29539907 rev/day
 Decay rate: 2.384e-05 rev/day \pm
 Epoch rev: 31090

Satellite OSCAR-10
 Catalog number 14129
 Epoch time: 87127.94011343
 Element set: 294
 Inclination: 27.3600 deg
 RA of node: 22.4822 deg
 Eccentricity: 0.6026009
 Arg of perigee: 206.2677 deg
 Mean anomaly: 103.2059 deg
 Mean motion: 2.05877224 rev/day
 Decay rate: 8.0e-08 rev/day \pm
 Epoch rev: 2933

Satellite OSCAR-11
 Catalog number 14781
 Epoch time: 87130.71721077
 Element set: 223
 Inclination: 98.0999 deg
 RA of node: 197.2916 deg
 Eccentricity: 0.0012564
 Arg of perigee: 213.2020 deg
 Mean anomaly: 146.8389 deg
 Mean motion: 14.62123990 rev/day
 Decay rate: 1.25e-06 rev/day \pm
 Epoch rev: 17022

Satellite OSCAR-12
 Catalog number 16909
 Epoch time: 87124.47110209
 Element set: 43
 Inclination: 50.0144 deg
 RA of node: 159.7116 deg
 Eccentricity: 0.0011293
 Arg of perigee: 174.0043 deg
 Mean anomaly: 186.0924 deg
 Mean motion: 12.44393849 rev/day
 Decay rate: -2.5e-07 rev/day \pm
 Epoch rev: 3294

Satellite RS-5
 Catalog number 12999
 Epoch time: 87130.83566117
 Element set: 403
 Inclination: 82.9530 deg
 RA of node: 288.5950 deg
 Eccentricity: 0.0009659
 Arg of perigee: 95.5876 deg
 Mean anomaly: 264.6293 deg
 Mean motion: 12.05066741 rev/day
 Decay rate: 1.2e-07 rev/day \pm
 Epoch rev: 23733

Satellite RS-7
 Catalog number 13001
 Epoch time: 87128.80415067
 Element set: 317
 Inclination: 82.9520 deg
 RA of node: 282.0535 deg
 Eccentricity: 0.0023170
 Arg of perigee: 11.8252 deg
 Mean anomaly: 348.3338 deg
 Mean motion: 12.08701313 rev/day
 Decay Rate 1.3e-07 rev/day \pm
 Epoch rev: 23601

Satellite mir
 Catalog number 16609
 Epoch time: 87135.12417875
 Element set: 627
 Inclination: 51.6306 deg
 RA of node: 327.0734 deg
 Eccentricity: 0.0016491
 Arg of perigee: 350.5428 deg
 Mean anomaly: 9.5254 deg
 Mean motion: 15.71612549 rev/day
 Decay rate: 1.1309e-04 rev/day \pm
 Epoch rev: 7084

Satellite NOAA-9
 Catalog number 15427
 Epoch time: 87120.74809367
 Element set: 162
 Inclination: 99.0457 deg
 RA of node: 85.9960 deg
 Eccentricity: 0.0015738
 Arg of perigee: 343.8338 deg
 Mean anomaly: 16.2329 deg
 Mean motion: 14.11491120 rev/day
 Decay rate: 8.3e-07 rev/day \pm
 Epoch rev: 12262

Satellite NOAA-10
 Catalog number 16969
 Epoch time: 87129.37342615
 Element set: 48
 Inclination: 98.7218 deg
 RA of node: 160.2968 deg
 Eccentricity: 0.0013482
 Arg of perigee: 326.8521 deg
 Mean anomaly: 33.1810 deg
 Mean motion: 14.22500742 rev/day
 Decay rate: 2.04e-06 rev/day \pm
 Epoch rev: 3332

AMSAT® NA

The Radio Amateur Satellite Corporation

Post Office Box 27
 Washington, DC 20044
 (301) 589-6062



Keith Pugh, W5IU, in the midst of the crowded Hamvention AMSAT booth.

Non-Profit
 Organization
 Second Class
 POSTAGE PAID
 at
 Waterbury, Conn.

LM-1096 KA6M 99.81
 MAGNUSKI, HANK
 2019 BARBARA DR.
 PALO ALTO CA 94303

Amateur Satellite Report (ISSN 0889-6089) is published biweekly for \$16 (inseparable from annual membership dues of \$24) by AMSAT, Post Office Box 27, Washington, DC 20044. Second class postage paid at Silver Spring, MD and additional mailing offices. POSTMASTER: send address changes to *Amateur Satellite Report*, Post Office Box 27, Washington, DC 20044.